

Observational Study of Ionising Radiation Exposure in Orthopaedic Theatre

Authors : Adam Aboalkaz, Rana Shamoon, Duncan Meikle, James Lewis

Abstract : Background and aims: In orthopaedic theatres, radiological screening during operations is a commonly used and useful technique to visualise and guide the operating surgeon. Within any theatre using ionising radiation, it is imperative that the use of protective equipment and the wearing of a dosimeter at all times. 1. To assess compliance with use of protective equipment during orthopaedic procedures involving ionising radiation. 2. To assess the radiation risk knowledge of staff members regularly present in an orthopaedic theatre of a national major trauma centre, in accordance to the ionising radiation regulation (2000) guidelines. Method: We conducted an Observational study of 21 operations at the University Hospital of Wales, which is a major trauma centre, recording the compliance with use of protective equipment (lead aprons and thyroid shields) and dosimeters. The observations were performed sporadically over a two week period to ensure that all staff in monitored operating theatres were not aware of the ongoing study, as to avoid bias. A questionnaire testing the knowledge of trainees and staff within the orthopaedic department was given following completion of the initial phase of the study, with 19 responses. The questions were based on knowledge of ionising radiation exposure and monitoring. The questions also tested the general staff knowledge of what equipment should be worn and where to locate such equipment. Results: This study found that only 25% of staff members were wearing thyroid protectors when less than 1 meter from the radiation source and only 50% were wearing appropriate lead aprons whilst in this same vicinity. The study also showed that 0% of all staff members used a dosimeter whilst in an area of radiation exposure. From the distributed questionnaires, only 40% of staff understood where to stand whilst radiation was being used, and only 25% of staff knew where to find protective equipment. Conclusion: Overall our audit showed poor compliance with regards to the National and local policies, due to lack of awareness of the policy and lack of basic ionising radiation exposure knowledge. It was evident from the observational study and questionnaire that staff were not fully aware of what equipment should be worn, where to find such equipment and did not appreciate that the distance from the ionising radiation source altered its exposure effect. This lack of knowledge may affect the staff health and safety after long term exposure. Changes to clinical practice: From the outcome of this study, we managed to drastically increase awareness of ionising radiation within the orthopaedic department. A mandatory teaching session on the safety of ionising radiation has been incorporated into the orthopaedic induction week for all staff. The dosimeters have been moved to a visible location within the trauma operating theatre and all staff made aware of where to find protective equipment.

Keywords : audit, ionising radiation, observational study, protection

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